Listing of the Claims:

1. (Original) A system for catalytically treating a gas stream, which comprises:

a) a gas phase reactor containing a catalyst for the treatment of the gas stream in at least one catalyst bed having an upstream end and a downstream end;

b) an axial fan positioned upstream of the at least one catalyst bed and having a rotatable impeller for moving the gas stream through the gas phase reactor; and,

c) gas flow modification means positioned between the impeller and the gas phase reactor for decreasing gas stream velocity, and increasing gas flow uniformity.

2. (Original) The system of claim 1 wherein the gas flow uniformity is increased by the gas flow modification means such that the gas stream entering the gas phase reactor has a velocity profile exhibiting not more than about 10% velocity deviation from an average gas stream velocity at the upstream end of the at least one catalyst bed.

3. (Original) The system of claim 2 wherein the velocity profile of the gas stream exhibits no more than about a 5% velocity deviation from an average gas stream velocity at the upstream end of the at least one catalyst bed.

4. (Original) The system of claim 1 wherein the axial fan includes a housing and a tail cone, and the gas flow modification means includes a distally pointing tapered end portion of the tail cone and a flared portion of the housing having a gradually increasing diameter.

5. (Original) The system of claim 4 wherein the gas flow modification means further includes a transition duct having perforated walls which flare outward so as to gradually increase cross-sectional area available to gas stream flow.

6. (Original) The system of claim 1 wherein the gas flow modification means includes a transition duct having perforated walls which flare outward so as to gradually increase cross-sectional area available to gas stream flow.

7. (Original) The system of claim 1 further including means for recycling a portion of the gas stream from downstream of the axial fan to a position upstream of the axial fan.

8. (Original) The system of claim 1 wherein the gas stream contains nitrogen oxide.

9. (Original) The system of claim 1 wherein the catalyst bed includes a plurality of stackable, individually separable modules containing one or more materials selected from the group consisting of vanadium oxide, aluminum oxide, titanium oxide, tungsten oxide, molybdenum oxide and zeolite.

10. (Original) The system of claim 9 wherein the modules each comprise a plurality of stacked catalyst elements having a honeycomb type structure.

11. (Original) The system of claim 1 wherein the catalyst bed comprises a catalyst supported on a mesh-like structure having a void space of at least about 85%.

12. (Original) The system of claim 1 wherein the catalyst bed includes a vanadium pentoxide catalyst on titanium oxide support.

13. (Original) The system of claim 1 wherein the gas phase reactor comprises at least two catalyst beds arranged in series.

14. (Original) The system of claim 1 wherein the fan impeller includes a plurality of blade units attached to and extending radially outward from a circumferential periphery of the impeller.

15. (Original) The system of claim 14 wherein the blade units each comprise two blades.

16. (Original) The system of claim 14 wherein the blade units have a variable pitch which is controllable while the impeller is rotating.

17. (Original) The system of claim 14 wherein the impeller has a variable speed of rotation which is adjustable while the impeller is rotating.

18. (Original) The system of claim 1 further including a heat recovery section positioned downstream of the gas phase reactor for cooling the gas stream.

19. (Original) The system of claim 1 further including means for introducing reducing agent into the gas stream.

20. (Original) The system of claim 19 further including a gas stream recycle manifold for communicating a portion of the gas stream downstream of the axial fan to a convection section of a furnace positioned upstream of the axial fan, wherein the means for introducing reducing agent comprises an inlet for introducing the reducing agent into the gas stream recycle manifold.

21. (Original) A system for catalytically treating a furnace flue gas, which comprises:

a) a gas phase reactor containing a catalyst for the treatment of the flue gas in at least one catalyst bed having an upstream end and a downstream end;

b) an axial fan positioned upstream of the at least one catalyst bed and downstream of a furnace and having a rotatable impeller for moving the flue gas from the furnace through the gas phase reactor; and,

c) means for recycling a portion of the flue gas from downstream of the axial fan to a convection section of the furnace located upstream of the axial fan.

22. (Original) The system of claim 21 wherein the means for recycling a portion of the flue gas comprises a gas stream recycle manifold.

23. (Original) The system of claim 22 wherein the gas stream recycle manifold includes an inlet for introducing reducing agent into recycle manifold.

24. (Original) The system of claim 22 wherein the gas stream recycle manifold includes a control valve.

25. (Original) The system of claim 22 further comprising a transition duct having perforated walls which flare outward so as to gradually increase cross-sectional area available to flue gas flow.

26. (Original) The system of claim 25 wherein the gas stream recycle manifold has at least one inlet connected to the transition duct, and at least one outlet connected to the convection section of the furnace.

27. (Original) The system of claim 21 wherein the axial fan includes a housing and a tail cone, the housing having a flared distal portion and the tail cone having a distally pointing tapered end portion.

28. (Original) The system of claim 21 wherein the catalyst bed includes a plurality of stackable, individually separable modules containing one or more materials selected from the group consisting of vanadium oxide, aluminum oxide, titanium oxide, tungsten oxide, molybdenum oxide and zeolite.

29. (Original) The system of claim 28 wherein the modules each comprise a plurality of stacked catalyst elements having a honeycomb type structure.

30. (Original) The system of claim 21 wherein the catalyst bed comprises a catalyst supported on a mesh-like structure having a void space of at least about 85%.

31. (Original) The system of claim 21 wherein the flue gas contains nitrogen oxide.

32. (Original) The system of claim 31 wherein the at least one catalyst bed includes a vanadium pentoxide catalyst on titanium oxide support.

33. (Original) The system of claim 21 wherein the gas phase reactor comprises at least two catalyst beds arranged in series.

34. (Original) The system of claim 21 wherein the fan impeller includes a plurality of blade units attached to and extending radially outward from a circumferential periphery of the impeller.

35. (Original) The system of claim 34 wherein the blade units each comprise two blades.

36. (Original) The system of claim 34 wherein the blade units have a variable pitch which is controllable while the impeller is rotating.

37. (Original) The system of claim 34 wherein the impeller has a variable speed of rotation which is adjustable while the impeller is rotating.

38. (Original) The system of claim 21 further including a heat recovery section positioned downstream of the gas phase reactor for cooling the flue gas.

Claims 39-49. (Canceled).

50. (New) The system of claim 1, wherein the gas flow modification means comprises:

a housing including a tail cone, wherein the housing surrounds the axial fan, and wherein the tail cone is positioned downstream from the axial fan; and,

a transitional duct having perforated walls that are flared outward disposed downstream from the housing.

51. (New) The system of claim 50, wherein the tail cone has a substantially conical shape and comprises a distally pointing tapered end portion.

52. (New) The system of claim 51, wherein the tail cone is supported within the housing by longitudinally oriented planar struts positioned in an annular space between the tail cone and an interior surface of the housing, wherein the struts act as baffles to reduce swirl and direct gas flow towards an axial flow of the flue gas through the system.

53. (New) The system of claim 50, wherein the housing further comprises:

an outlet, wherein a diameter of the outlet is greater than a diameter of an impeller of the axial fan, and wherein the circumference of the housing gradually increases from a position of the housing at the axial fan to the outlet of the housing.

54. (New) The system of claim 50, wherein the gas flow modification means further comprises a guide vane unit disposed at an inlet of the transition duct, wherein the guide vane unit includes louvers for redirecting the flow of the flue gas.

55. (New) The system of claim 4, wherein the gas flow modification means further comprises:

a transition duct having perforated walls that flare outward positioned downstream from the housing; and,

a guide vane unit disposed at an inlet of the transition duct, wherein the guide vane unit includes louvers for redirecting the flow of the flue gas.

56. (New) The system of claim 6, wherein the gas flow modification means further comprises:

a transition duct having perforated walls that flare outward positioned downstream from the housing; and,

a guide vane unit disposed at an inlet of the transition duct, wherein the guide vane unit includes louvers for redirecting the flow of the flue gas.

57. (New) The system of claim 27, wherein the gas flow modification means further comprises:

a transition duct having perforated walls that flare outward positioned downstream from the housing; and,

a guide vane unit disposed at an inlet of the transition duct, wherein the guide vane unit includes louvers for redirecting the flow of the flue gas.